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STATUS AND MANAGEMENT RECOMMENDATIONS FOR RAPTORIAL BIRDS INHABITING THE CHALLIS PLANNING UNIT SALMON DISTRICT BLM, USDI, IDAHO

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By

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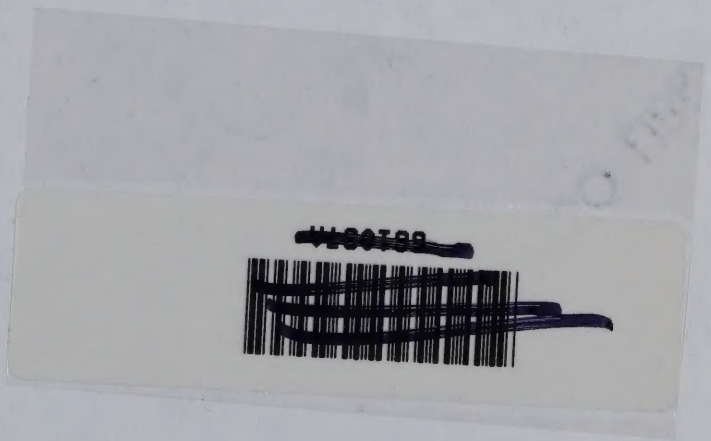

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CHAPTER I

INTRODUCTION

The role of raptorial birds in the ecosystem has long been understood by man. In early times birds of prey were an object of curiosity, but in more recent times they have been persecuted and described as "vermin." Today we understand the important role that raptors play as predators in controlling their prey populations. The majority of people that have traditionally killed raptors have been stopped because all birds of prey are protected by the Migratory Bird Treaty Act of 1936 and its additions in 1972. We now view hawks, owls, falcons, and eagles as valuable environmental indicators. These birds exist at the top of food chains and as predators are most affected by pesticides and other pollutants, and are thus indicators. In addition to the above factors, habitat alteration and destruction have negative impacts on raptorial birds. When land use reduces or eliminates the prey populations of these predators, they are as equally eliminated as their prey.

Birds of prey have lived on the Challis Planning Unit probably since before the appearance of man. This area was first settled by white men in the late 1800's when gold was discovered. Indians, of course, far outdate these men in the area. Today much of the land adjacent to the Salmon River is irrigated and under cultivation. Lands out of the floodplain are grazed by cattle and where forests occur logging sometimes takes place. Gold and silver mines are still in

operation at several locations. The great recreational potential of the Salmon River area draws tourists, making it another of the important industries. The impact of development is to cause reductions in the number of individuals comprising local raptor populations. We are now confronted with many species which face extinction or severe restriction across their range if not properly protected and managed (Hickey et. al. 1969). The most important and effective consideration in managing all wildlife species is, as always, habitat management (Olendorff and Stoddart 1974).

CHAPTER II

DESCRIPTION OF THE STUDY AREA

The Challis Planning Unit is located in the central part of Idaho some 60 miles south of Salmon (Figure 1). Its boundaries enclose some 587 $mi.^2$ of land. Approximately 10 percent of this amount of land is under private ownership, 5 percent state, and 85 percent under BLM ownership. The elevation above sea level of the area is 5,000 to 9,720 feet (1,524 m to 2,963 m). Prominent features of the area are the town of Challis, Idaho, the Salmon River and its East Fork, and Lone Pine Peak (highest point). Rainfall averages between 7 and 25 in. per year (average 15 in.). The vegetation of the area is primarily grasses (Graminiae), sagebrush (Artemideae), and occasionally pine trees (Pinus sp.). Mountain mahogany (Cerocarpus sp.) occurs commonly only in the southeastern portion of the study area. The major habitat types are sagebrush shrubland, riparian woodland, and pine forest.

The geology of the area is fairly complex. Precambrian formations containing quartz and limestone can be found in the northern portion of the area. The higher peaks boardering the planning unit, White Cloud and Pahsimeroi Mountains, are predominately grey granites of the Idaho Batholith. In the center of these granites are the Border Zone rocks. A lava flow of the Challis volcano covered parts of the area two million years ago. Erosion has carved canyons and valleys across these formations leaving behind exposed rock, sometimes in the form of

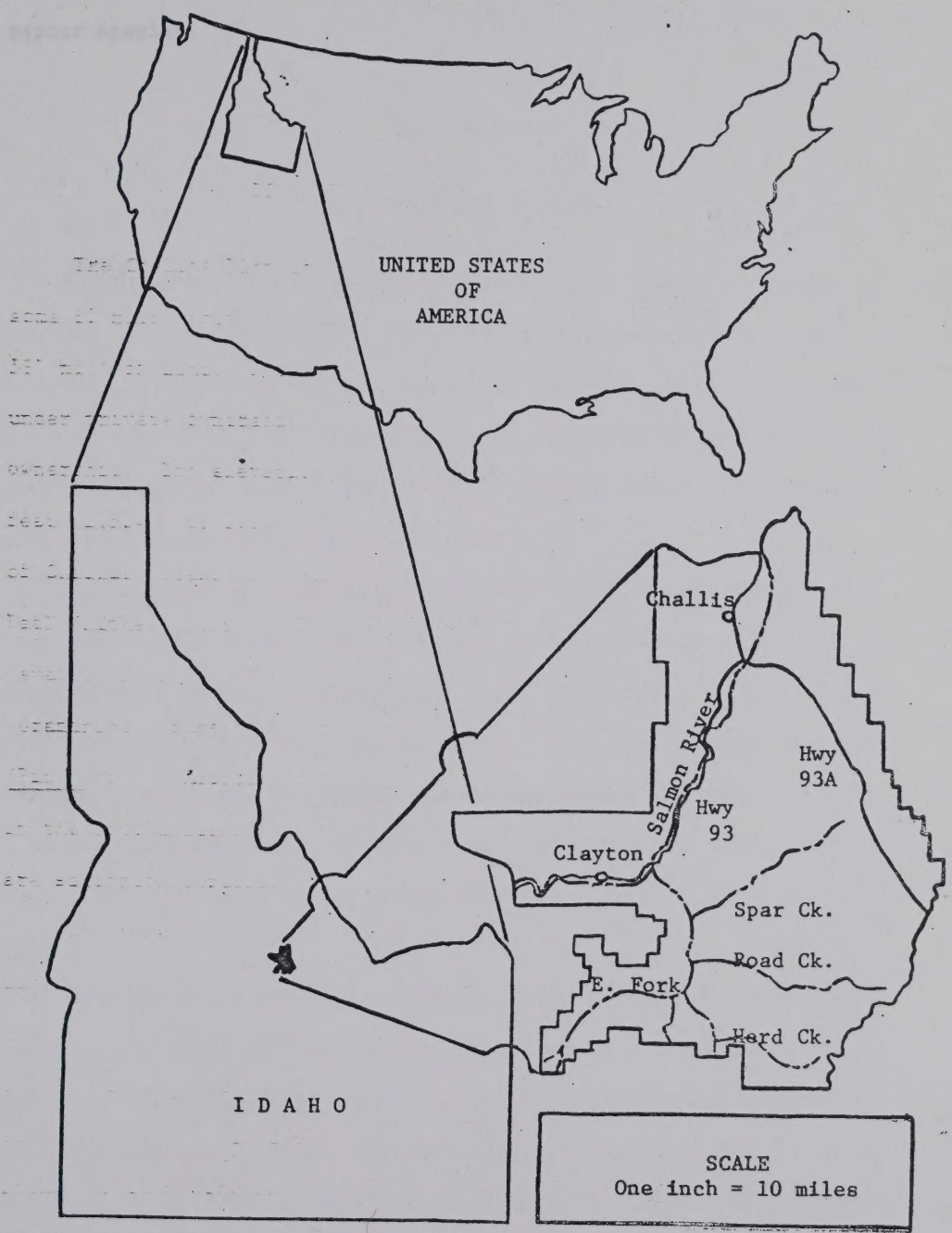


Figure 1. Location of the Challis Planning Unit, Salmon District, Bureau of Land Management, U.S. Department of Interior, Idaho.

a cliff. It is these cliffs that are the nesting areas for many raptor species.

CHAPTER III

MATERIALS AND METHODS

The field portion of the investigation began after the raptor breeding cycle was complete. Observations were made from automobile (four-wheel drive Scout 800-A), fixed-wing aircraft (Cessna single-engine), and roto-winged aircraft (Bell 206 Jet Ranger). While working from the ground, binoculars (8 x 30 Ziess) and a spotting scope (30X Bushnell) were used to scan cliffs and hillsides.

The location of cliff areas were marked on U.S.G.S. topographic maps (1:250,000) while on site and were later transferred to more detailed maps (U.S.G.S., 1:24,000). Notes on suitability of each site were recorded in a journal (Mosby, 1969). When raptors were seen, the species, number of individuals, sex and age (where possible), and location where seen were recorded on Raptor Count Sheets (Figure 2). Photographs were taken (35mm Miranda FvT) to record geologic and habitat types.

When the field work was complete, a composite map was prepared by plotting all known and suspected nesting areas and using different symbols for each species. Individual sightings of important species were also plotted on this topographic map (1:250,000). Nesting areas were ranked using the classification of suitable (suspected), occupied, and marginal. Marginal nesting areas were not used in estimating the number of potential (or suspected) nesting areas. The reason for this

RAPTOR COUNT DATE_____ OBSERVERS_____ GENERAL ROUTE_____

SPECIFIC ROUTE_____

CONDITIONS_____

Starting time_____ and mileage_____; ending time_____ and mileage_____. Comments_____

Species	Mileage from start, with number of birds and description (see below) at each entry	Total
Cooper Hawk		
Sh.-shin Hawk		
Goshawk		
Red-t. Hawk		
Swain. Hawk		
Ferr. Hawk		
G. Eagle		
B. Eagle		
Marsh Hawk		
Kestrel		
Pigeon Hawk		
Prair. Fal.		
Peregr. Fal.		
Osprey		

Conditions to include time of day, weather, habitats, speed, observation stops, and other information of interest. Where possible indicate age, sex, color phase, subspecies, and other relevant data. Ad=adult, im=immature, sub=subadult, lt=light phase, dk=dark, int=intermediate, ♂=male, and ♀=female.

Figure 2. Form sheets used during all ground and air surveys for systematic recording of raptorial birds observed. Dr. J. P. Hubbard, Endangered Species Project, New Mexico Department of Game and Fish prepared the form.

is that they are not currently suitable, and even historically were probably only occupied during periods of high population density. Marginal sites were lacking in one or more requirements which include: cliff too small, cliff without suitable nesting shelves, or cliff located close to a much better site. The number of occupied and suspected nesting areas were then tabulated by species.

A range condition overlay (scale 1:250,000) was prepared by interviewing each member of the AMP team. Each person drew the boundaries of his respective area by first assigning values for habitat condition and then values for habitat potential. The classifications of poor, fair, good, and excellent were assigned and indicate the relationship of plant density and species diversity of range plants found in the study area.

CHAPTER IV

RESULTS AND DISCUSSION

The study was designed to identify what species of raptors exist, their numbers, location, and present status on the Challis Planning Unit. The species of interest to BLM and to be studied intensively were Golden Eagle (Aquila chrysaetos), Bald Eagle (Haliaeetus leucocephalus), Osprey (Pandion haliaetus), Ferruginous Hawk (Buteo regalis), Peregrine Falcon (Falco peregrinus), Prairie Falcon (Falco mexicanus), and Pigeon Hawk (Falco columbarius). However, the following species from this group were not seen: Bald Eagle, Osprey, Ferruginous Hawk, and Pigeon Hawk. Any other species of raptors encountered were to be studied only as time allowed. The additional species seen included: Red-tailed Hawk (Buteo jamacensis), Great Horned Owl (Bubo virginianus), American Kestrel (Falco sparverius), and Marsh Hawk (Circus cyaneus). The nesting success of these birds could not be accurately assessed because the study was not initiated until after the raptor breeding cycle had ended.

Golden Eagle

Man has historically attempted to eliminate eagles because of conflicts by eagles with his interest, primarily in areas where the eagle is thought to prey heavily on domestic livestock (Wiley and Bolen 1971). This attitude still prevails in many areas (Spofford 1969).

The killing of eagles is prohibited under the Bald Eagle Act which also protects Golden Eagles as of ammendments passed in 1963. Although eagle killings still occur, they are probably at their lowest level since 1900 (Braun et. al. 1975).

The population size of Golden Eagles in North America is presently estimated at 50,000 to 100,000 individuals (Braun et. al. 1975). Nesting has been recorded in both trees and on cliffs (Bent 1937). Two eggs comprise the average clutch and are laid between mid-March and mid-May. A study conducted by the Idaho Cooperative Wildlife Research Unit in the southwestern part of the state identified a fledging rate of 1.1 to 1.2 young per nesting attempt (Kochert 1972). The most important mortality factors identified for the species are pesticide contamination of foods (Kochert 1972), illegal shooting, and electrocution (Hamerstrom et. al. 1975). Important prey in southwestern Idaho are Blacktail Jackrabbit (Lepus californicus), Desert Cottontail (Sylvilagus audoboni), Yellow-bellied Marmot (Marmota flaviventris), Townsend Ground Squirrel (Spermophilus townsendi), Desert Woodrat (Neotoma lepida), Ring-necked Pheasant (Phasianus colchicus), Rock Dove (Columba livia), Chuckar (Alectoris graeca), Black-billed Magpie (Pica pica), and Bull Snake (Pituophis melanoleucus) (Kochert 1972).

During this study, 42 sticknests of Golden Eagles were located with as many as three nests on a single cliff. It is believed that these nests represent 16 nesting pairs (Table I), based on a 25 mile^2 (64.4 km^2) territory or five mile (8 km) spacing of active nests (Dixon 1937). However, Kochert (1972) found an average of six alternate nests per pair; therefore, seven nesting territories is also a realistic number. A total of 15 individual Golden Eagles were seen,

TABLE I

THE NUMBER OF NESTING TERRITORIES OF SELECTED SPECIES OF RAPTORS, CHALLIS PLANNING UNIT, AUGUST 1975

Species	Nesting Territories	
	Occupied	Possible
G. Eagle	8	16
B. Eagle	-	-
Osprey	-	-
Ferrug. Hk.	-	-
Peregr. Fal.	1	5
Prairie Fal.	2	11
Pigeon Hk.	-	-
TOTAL	11	33

of which only two were immatures (Table II). The locations at which eagles were seen indicate that eight of the 16 nesting territories were occupied by one or more eagles. They also indicate a relationship between range condition (Figure 3) and eagle activity. Golden Eagle activity during the study period on the Challis Planning Unit appears to be directly related to range condition. This was determined by plotting range condition against the number of eagles seen (Figure 4). The range condition will more or less dictate areas where greater prey abundance may occur. Food availability for both prey and thus their

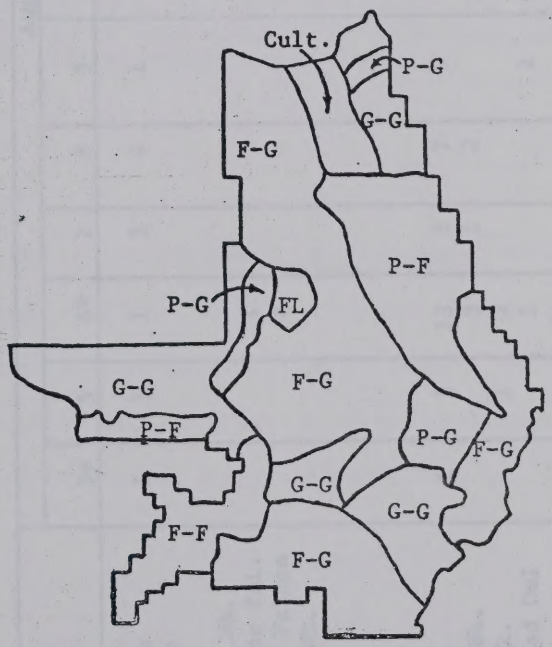


Figure 3. Map showing range condition followed by its potential as expressed by the members of the AMP team, Challis Planning Unit, BLM, Idaho, August 1975. A scale of poor, fair, good, and excellent was used to indicate the relationship of plant density and species diversity while considering soil type and condition. Cult. - Cultivated lands; FL - Area classified as Frail Lands and no grazing is allowed.

TABLE II

RAPTORS OBSERVED AND OBSERVATION EFFECTIVENESS ON THE CHALLIS PLANNING UNIT, BLM, USDI, IDAHO, AUGUST 1975

Species	August Date											
	5+	5	6*	7	8	9	10	11	12	ad.	im.	Total
G. Eagle	1	5	1	3	4	1				13	2	15
B. Eagle												0
Osprey												0
Ferrug. Hk.												0
Peregrine Fal.			1							1	0	1
Prairie Falcon			3									3
Pigeon Hk.												0
Others:												
Kestrel	1	3	13	5	7	9	4	5	1			48
Red-t. Hk.			3	1	2		1			7	0	7
Marsh Hk.		1	2									3
G. Horned Owl			1			1						2
Total	2	8	15	9	13	11	5	5	1	-	-	79
Hours of Obsn.	2.5	7.5	6.0	8.5	9.5	7.5	3.5	4.0	0.5			54
Birds/Hour	0.8	1.1	2.5	1.1	1.4	1.5	1.4	1.3	2.0			1.5 avg.

+ - Fixed-wing aircraft obsn.; * - Roto-winged aircraft obsn.; All others are ground obsn.

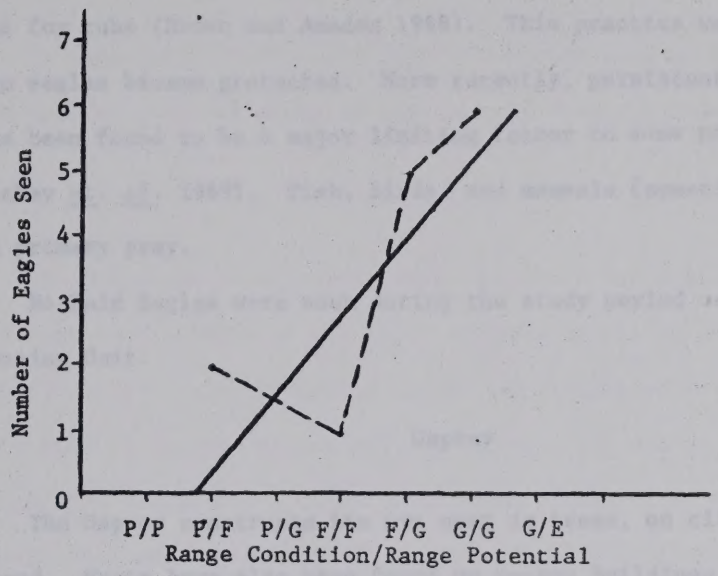
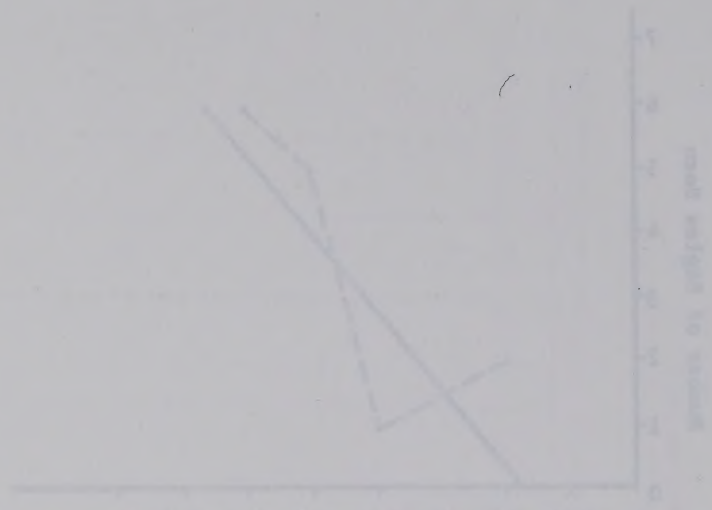


Figure 4. The relationship of range condition and potential to the number of Golden Eagles seen utilizing the Challis Planning Unit, Bureau of Land Management, U. S. Department of the Interior, in central Idaho, August 1975.

associated predators is thought to be associated with range condition. Thus, when range condition is lowered significantly by overgrazing or natural disasters, lowered range use by eagles, elimination of some individuals, and in extreme cases, a lowering of reproductive success can be expected (Craighead and Craighead 1956).

Bald Eagle

The Bald Eagle constructs its own nests usually in trees near an inland lake. Two eggs are normally laid in late March or early April. In Alaska, bounties were paid for killing eagles because of their alleged depredations on salmon, lambs of domestic and mountain sheep,



and fox cubs (Brown and Amadon 1968). This practice was discontinued when eagles became protected. More recently, persistant pesticides have been found to be a major limiting factor to some populations (Hickey et. al. 1969). Fish, birds, and mammals (sometimes as carrion) are primary prey.

No Bald Eagles were seen during the study period on the Challis Planning Unit.

Osprey

The Osprey constructs its own nest in trees, on cliffs, or the ground. Nests have also been found on vacant buildings, docks, and telephone poles. These habits have made attempts to provide artificial nesting platforms very successful (Rhodes 1972; Postupalsky and Stackpole 1974). The normal clutch is three eggs and is laid in late April or May. Osprey were commonly shot at fish hatcheries not too many years ago, but persistent pesticides are presently the greatest threat to Osprey populations (Peterson 1969). Food is almost entirely fish that are taken alive. Birds and frogs are taken, but not commonly.

No Ospreys were seen on the Challis Planning Unit during the study period.

Ferruginous Hawk

The Ferruginous Hawk nests in trees, on cliffs, and even on the ground. It always chooses the highest tree or hilltop with a good vantage point. Three to four eggs are laid in April or May. The species feeds on medium-sized mammals, such as ground squirrels and prairie dogs. Mice, rabbits, and meadowlarks are also important prey (Brown and Amadon 1968).

No Ferruginous Hawks were seen and no evidence of nesting of this species could be found on the Challis Planning Unit.

Peregrine Falcon

The Peregrine is a cosmopolitan species which occurs on all continents and on many of the major islands of the world (Hickey and Anderson 1969). Its powers of flight are surpassed by no other; thus, it is said to be the fastest bird on earth. The number of Peregrines has dropped dramatically to extremely low levels. In response to this population crash, it was added to the List of Endangered Native Fish and Wildlife (Schriener 1963).

The number of subspecies of Peregrines world-wide is somewhere between 12 and 21 (Hickey and Anderson 1969), with at least three described for North America (White 1968). The American Peregrine or anatum subspecies occurs in the western United States and is the subject of this portion of the investigation. The nesting requirements of Peregrines are as follows: available water during the entire nesting period, high sheer cliffs (averaging 178 ft. in height in Utah), cliff exposure generally north or east, and a suitable nesting shelf (Porter and White 1973). The average clutch of eggs is three and they are laid between mid-April and mid-May. The female incubates 60 to 70 percent of the time and does all of the brooding (Enderson et. al. 1973). The normal fledging success was probably between two to three young per eyrie before the late 1940's. Fledging success in Colorado was found to be 0.15 young per active eyrie in 1973 (Enderson and Craig 1974). A breeding population of approximately 100 pairs in California declined to fewer than 10 known pairs in 1969 with the major decline

taking place between 1951 and 1960 (Herman et. al. 1970). Nelson (1969) checked 29 Peregrine eyries in Washington, Oregon, Idaho, Montana, Wyoming, and Utah, which were active in 1938, and subsequently found only six sites occupied. Egg shell thinning and eventual egg breakage during incubation has been identified as the basic problem (Ratcliffe 1967). The real villian has been identified as persistent pesticides, primarily DDT and DDE (Hickey and Anderson 1968; Ratcliffe 1970; Cade et. al. 1971). These substances become increasingly concentrated when passed along food chains, the highest level (predators) receiving the greatest dose.

Important Peregrine prey in Colorado are: Clark's Nutcracker (Nucifraga columbiana), Steller's Jay (Cyanocitta stelleri), Pinon Jay (Gymnorhinus cyanocephalus), Robin (Turdus migratorius), Brewer's Blackbird (Euphagus cyanocephalus), Red-winged Blackbird (Agelaius phoeniceus), Mourning Dove (Zenaida macroura), Rock Dove, Meadowlark (Sturnella neglecta), Starling (Sturnus vulgaris), Black-billed Magpie, and White-throated Swift (Aeronautes saxatalis) (Enderson and Craig 1974).

During the study period, only one Peregrine Falcon (an adult) was seen (Table II). The cliff at which this bird was seen was the most suitable that exists for Peregrines on the Challis Planning Unit. Four other cliff areas were also located, but these were not as high as the former and, therefore, are slightly less suitable than the first location mentioned. Each of these four sites would be suitable locations for the controlled release of young Peregrines when captive breeding projects begin to produce large volumes of Peregrines (Cade 1974). The primary conditions that must be met for successful recovery

or release of Peregrines is first, that the pesticide use ban must be continued, and secondly, that the local habitats at historic eyries not be altered significantly (prey populations are preserved). Mines and homes occupy positions beneath and adjacent to each of these four areas indicating that either movement of these facilities (probably not feasible) or extensive public education will have to be a part of any attempts to maintain or increase the number of Peregrines inhabiting the Challis Planning Unit. However, great caution must be used in revealing nest locations.

Prairie Falcon

The population size of this species in Colorado and Wyoming is estimated at 600 nesting pairs (Brown and Amadon 1968). New Mexico has an estimated 300 nesting pairs (Platt unpubl. report). The Prairie Falcon nests exclusively on cliffs utilizing abandonded sticknests of Common Ravens (Corvus corax) and Golden Eagles, or potholes, ledges, and shelves nesting on depris that is available (Enderson 1964). The clutch is usually four or five eggs which are laid in April or early May. Fledging success in Colorado was 1.1 young per pair studied (Enderson 1964). Persistent pesticides can affect Prairie Falcon productivity (Enderson and Berger 1970), but because they occur primarily in non-agricultural areas and feed from terrestrial prey bases, rather than aquatic ones, pesticides are not an important limiting factor. Nesting pairs, where nest sites are not limiting, were found to average five miles apart (Platt unpubl. report). Primary prey are small larks and ground squirrels with medium-sized birds and reptiles also being consumed.

During the study period three Prairie Falcons were seen, all from the helicopter. They were seen at two locations, each of which was a suitable nesting area. An additional nine suitable nesting cliffs were located within the planning unit, but no Prairie Falcons were seen near them (Table I).

Pigeon Hawk

This species nests in trees in a mixture of open country and sparse woodland, referred to as parkland (Temple 1972). Five to six eggs are laid in the period of early April and early May. Pigeon Hawks prey chiefly on small birds that frequent ground or low vegetation, such as larks, pipits, and small finches.

No Pigeon Hawks were seen during the study period on the Challis Planning Unit.

Effectiveness of Observation

Initial observation of wildlife on this continent was from foot or horseback and more recently from automobile. The most recent development has been the use of aircraft in making observations in short periods of time over large areas. Although several disadvantages and precautions are identified in the use of aircraft (Ruhl 1932), the advantages are thought to far outweight the disadvantages (White and Sherrod 1973). Fixed-wing aircraft are effective in covering large areas and are the least expensive to operate (Hickman 1972). However, their minimum air speed reduces their effectiveness for making detailed observations (i.e., counting young or eggs) unless they are modified with special equipment (STOL) to reduce minimum air speed. Roto-winged

aircraft are now commonly used in wildlife investigations and management, particularly in the mountain areas of the western United States. Their higher-per-hour cost has deemed them too expensive in many situations.

During this study, I was fortunate enough to be able to use and compare both ground and aerial observation techniques in the same area and period of time. The average number of raptors seen per hour from the ground was 1.4 (Table II). Fixed-wing observation averaged 0.8 birds per hour and roto-wing aircraft 2.5 birds per hour. The accuracy and completeness of locating all species of raptors and their nesting areas was significantly increased with the helicopter.

The effectiveness of any tool is determined largely by the skill of the operator. This holds true in the use of aircraft. A survey will be no better than the pilot who operates the aircraft. The pilot must follow instructions and stick to flying the aircraft for safety reasons. It is important to have at least one other observer other than the primary observer. I am convinced that where possible, the roto-winged aircraft should be used in raptor nesting surveys. Fixed-wing usually does not cause adults to leave the nest. These adult birds block the view of eggs or young, reducing the completeness of the survey. The roto-winged aircraft flying past at a distance (1/2 mi.), and then making a series of low speed passes (20 to 30 mph, in horizontal passes of 50 to 100 verticle ft. apart) will usually cause adults to fly without surprising incubating or brooding adults who could harm eggs or young if they tried to escape from the nest when surprised (White and Sherrod 1973).

CHAPTER V

MANAGEMENT RECOMMENDATIONS

In the past, we have merely researched the status of raptorial populations. It is now time that we apply what has been learned by this research in the form of management. In the long term, habitat management will be the most important technique. However, in the short term we must monitor the population's reproductive success and possibly use techniques such as nest site improvements or nestling manipulations (Olendorff and Stoddart 1974). In the case of endangered and threatened species, we must go farther, using techniques such as captive propagation, restocking, and egg manipulations (double clutching) if we are to maintain these populations (Cade 1974).

The following recommendations for eagle management are appropriate here (Hamerstrom et. al. 1975):

1. Federal and state agencies should identify and protect all concentrations of nesting eagles on public lands. Where unusual nesting concentrations of eagles occur, it may be desirable to establish refuges for the protection of nesting birds. Locations of eyries should not be publicized.

2. Utility companies should be encouraged to eliminate all hazardous perches on transmission lines (Miller et. al. 1975).

3. Increased research should be supported by livestock interests in order to ascertain exact cause of death of newly born lambs and kids in herderless pastures.

4. Education of sportsmen and recreationists concerning the value of large raptors must be given major emphasis by federal and state land management and conservation agencies.

5. The ban on use of toxic substances such as thallium and sodium monofluoracetate (1080) must continue on public lands. If other alternatives are not available, use of poisons should be carefully controlled and supervised by trained personnel.

6. Traps used in the capture of predatory animals should be modified to prevent crushing of the legs of eagles and other raptors.

7. Efforts to reduce and eliminate contamination of the environment with persistent pesticides should be continued.

8. Hunting any wildlife by plane should be outlawed. Pilots convicted of aiding in the molesting of federally protected species should have their license suspended or revoked by the Federal Aviation Administration.

9. Ranchers who lease public lands for grazing and who are convicted of molesting raptors should have their lease applications denied by the responsible state or federal agency.

10. Additional research should be conducted in determining the origin of wintering eagles, especially in the western United States.

11. Where eagles have been extirpated, introduction techniques should be researched and implemented.

12. Where large concentrations of nesting raptors exist, efforts should be made to maintain significant portions of the plant-animal communities in a "natural" (relatively undisturbed) condition. This will help insure that appropriate prey species are available to the raptors.

I find only one additional recommendation to be made. It is as follows:

13. Additional research should be conducted in determining the reproductive status and immediate management steps, according to need and feasibility, necessary to maintain existing populations. This is necessary because this study was conducted after the raptor breeding cycle; thus, no information concerning current productivity was obtained.

It should be emphasized that the last part of recommendation (1.) should not be overlooked; i.e., eyrie locations should not be publicized. This will be hard to implement because of conflicts with the Freedom of Information Act. All endangered or threatened species locations were given directly to the Peregrine Recovery Team, U. S. Fish and Wildlife Service, U.S.D.I., Denver, Colorado.

Each of these recommendations can be applied to species other than eagles (Table III). The table is a comprehensive guide to management steps suggested for each species. Suggestions for species not seen during the study period apply because these birds exist elsewhere in the state during summer or migration periods (American Birds 1975).

A series of detailed discussions of habitat management for several endangered species is available from the Bureau of Land Management, Denver Service Center (Snow et. seq. 1972).

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TABLE III

RAPTOR MANAGEMENT RECOMMENDATIONS APPROPRIATE FOR USE ON THE CHALLIS PLANNING UNIT, BLM, USDI, IDAHO 1975

Species	Recommendation Number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Golden Eagle		X	X	X	X	X		X	X				
Bald Eagle		X		X	X	X	X	X	X	X			
Osprey				X	X	X	X	X	X				
Ferruginous Hawk				X	X	X		X	X				
Peregrine Falcon				X	X	X	X	X	X	X	X	X	X
Prairie Falcon				X	X	X		X	X				X
Pigeon Hawk				X	X	X		X	X				
TOTAL	0	2	1	7	7	7	3	7	7	2	1	1	3

TABLE III (Cont.)

Species	Where Present			
	Summer	Fall	Winter	Spring
Golden Eagle	X	X	X	X
Bald Eagle	*	X	X	*
Osprey	*	X	?	X
Ferruginous Hawk	*	X	X	X
Peregrine Falcon	X	X	X	X
Prairie Falcon	X	X	X	X
Pigeon Hawk	*	X	?	X
TOTAL	3	7	5	7

* - Indicates presence within the state but not necessarily on the planning unit, ? - Indicates probable migration through the area.

SUMMARY

Research was conducted in central Idaho from 5 to 12 August 1975, with the following objectives: (1) to identify the species of raptorial birds, (2) to inventory existing and possible future nesting areas, (3) to identify hunting areas, and (4) to make management recommendations to insure their existence on the Challis Planning Unit, BLM, U.S.D.I., Idaho.

Seven species of raptors were identified. A total of 15 Golden Eagles and 42 nests comprising between 7 and 16 nesting territories were located. Bald Eagle, Osprey, Ferruginous Hawk, and Pigeon Hawk were outlined as species to be studied, but none were seen. A single adult Peregrine Falcon was located at an excellent nesting cliff. Four other cliffs of lesser suitability, that are probably adequate for Peregrine habitation, were not observed to be occupied. A total of three Prairie Falcons were seen at two suitable nesting cliffs. Eight other cliffs suitable for Prairie Falcon habitation were identified but no falcons were seen at them. Other species observed were American Kestrel, Red-tailed Hawk, Marsh Hawk, and Great Horned Owl.

Golden Eagle hunting activity was low in areas where range condition was lowered significantly from its potential by grazing. Peregrine Falcon nesting cliffs and their local habitats must be preserved, even where Peregrines are absent, so that reintroduction or rehabilitation can take place in the future. Prairie Falcons were observed in considerably lesser numbers than expected. Prairie Falcons

and Common Ravens inhabit similar habitats. No ravens were seen. The low number of falcons may indicate either poor habitat condition (poor prey base) or low availability of adequate nesting sites. It is also possible that many Prairie Falcons could have moved out of the area as is the case during this time of year at the Snake River Birds of Prey Natural Area, Idaho.

Observation from the ground was more effective than from fixed-wing aircraft in locating raptors. Observation from roto-winged aircraft was considerably more effective than either of the two later techniques. The high cost of roto-winged observation can be justified due to the fact that large areas can be accessed in short periods of time with greater accuracy than from the ground (if cliffs are not climbed) or fixed-wing aircraft. Roto-winged aircraft use may be less disturbing to the birds than ground observation.

Habitat management is the most important long term consideration. The monitoring of present population reproductive success and a study of need and feasibility of utilizing the techniques of nest site improvement or nestling manipulation should be carried out as soon as possible. Endangered and threatened species can be aided by captive propogation, restocking, and egg manipulations (where federal permits can be obtained). These species should receive priority in land use planning. Locations of eyries should not be publicized. Public education, ban of the use of toxic substances (e.g. 1080), modification of any steel traps, ban of hunting from aircraft, continued ban of pesticide use (DDT and DDE), and additional research are also important recommendations.

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